~~SECRET~~

CMCC Doc.No.274X5.9
Copy 2 of 3

25X1A

23655
COPY 1 OF 1

To: [redacted]

From:

15 January 1958

Info: Headquarters

Subject: Reply to "Report on System 3 and Other Things" dated 10 October 1957.

The paragraphing in this letter corresponds to the paragraphing of the report referenced in the subject above.

3. The reference reports mistuning of the System 3 first LO after a few days on the shelf. This sounds more like mechanical creepage of self-supported coils rather than crystal ageing.

4. Spurious oscillations close to the crystal frequency can be caused by a number of factors:

(a) An extraneous series tuned circuit consisting of the secondary of L515, the crystal and crystal holder capacity, plus strays.

(b) An accidental parallel resonant circuit at the grid.

(c) A self resonance of the primary of L514.

(d) Stray coupling between L514 and L511, 509 or 508.

(e) Any combination of the above, plus any combination of all other types of feedback.

Unless a great deal of feedback is involved, any of these effects should be marked by the high Ω feedback loop present when Y502 is installed and active.

5. When the System 3 test set LF selector switch is in positions 17 and 18, the 6th crystal in the second LO is active. Therefore, the interval counter will not change when the switch is changed from positions 17 to position 18. Position 17 tests for receiver lock-on during the first increment of the 350-kc sweeping oscillator. Position 18 tests for lock-on during the last or highest frequency increment of the sweeping oscillator. The increment counter should read 1 and 35 on switch positions 17 and 18, respectively, although in practice it usually reads 4 and 35. When a reading is taken on switch position 17, the read-recycle switch should be pushed before reading position 18.

~~SECRET~~

To: [redacted] 15 January 1958

6. There has been no mod kit to improve the reliability of the sweep-control circuit in the third LO board. At one time there was a field proposal to increase C1855 from 1000 μμf to 2000 μμf to improve performance before warm-up, but Production found that when poor performance was observed before warm-up, it was caused by malfunctions. If you have information to the contrary, please advise.

14. The E rack of the data reduction equipment is the only rack that includes a System 3 pulse-train eliminator. The E rack probably will not be shipped to Detachment B or Detachment C.

16. The variation in System 3 receiver gain from one band to another is a function of the effective circuit Q's, differences in LO coupling to the mixer, and the normal impedance effects in LO-mixer circuitry. The median gain from r-f input to first i-f output is 12 db.

The gain from r-f input to i-f output may be measured as follows:

Place the 02B, C, or D board in the test jig. Use a 608-D as the r-f source. Use a 531 scope, or equivalent, and the special r-f detector probe which has been supplied to you to make the measurements. After connecting the source to the LO board, set the source to a frequency corresponding to the channel frequency under measurement and use 1000-cps modulation. Measure the source voltage at pin one of the amplifier on the scope with the channel gated "off" by the jig. Gate the channel "on" with the jig, and adjust the source until the same level is obtained on the scope with the scope input connected to the BNC connector on the jig labeled "output." The difference between the 608-D settings is the gain.

The alignment procedure described in the referenced report does not take into account the peaks and dips in the frequency-response curve of the input transmission line. Also, only approximate alignment can be made in the jig, even with the cover can. At times the oscillator crystal will lose control when the board is taken out of the jig and placed in the system. The alignment method described in the referenced report appears to be the best method - providing that a final adjustment is made with the board in the system. The final criterian should always be over-all system performance.

SECRET

CMCC Doc. No. 274X5.9
Copy 2 of 3

25X1A

To: [redacted] WRSP-2

15 January 1958

Addenda

B.1. Obtaining the i-f transformer response as described in the reference will mistune the r-f section slightly. The i-f transformer was designed with a center frequency of 28 mc with a bandwidth of approximately 4 mc. With the associated circuitry, the bandwidth at the i-f input is approximately 5.6 mc. The transformer and associated circuitry in the test jig attempts to simulate the actual i-f input impedance. When the jig was tested at the factory, the bandwidth was somewhat narrower than 5.6 mc and probably accounts for the results you obtained in the test jig. Again, the final criterian should be system performance rather than performance in the test jig.

B.5. The tracker keys both the System 1 and System 3 recorder. The tracker is always used on every mission.

D. The input impedance of the System 3 preamp is a little greater than 100 ohms nominally. The absolute impedance varies moderately as a function of frequency. Production tests are made by coupling the 608-D signal generator directly to the input to determine sensitivity.

E.2. Two i-f boards have been modified and returned to the depot. You will receive a copy of our shipping document.

25X1A

[redacted]

PWA:hcp

SECRET